

# Program Directors' Perspectives on Technology Integration in Adult Education and Literacy Classrooms

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## Abstract

This qualitative study investigated the status of technology integration in Texas adult education and literacy classrooms from the perspective of program directors. Researchers conducted 15 semi-structured interviews to learn about technology integration. The findings revealed that available technology resources, teaching and integrating digital literacy skills, professional development opportunities, and IT support contributed to the success of technology integration. In contrast, limited access to technology resources and the internet, professional development costs, and instructors' time and skill constraints were barriers to integrating technology into adult education and literacy classrooms. Providing various resources and ongoing support to improve technology integration in adult education and literacy programs is necessary. Recommendations for practice and future research are provided.

**Keywords:** technology integration, blended learning, adult education and literacy, professional development, peer support

Technological advancements like smartphones, computers, and tablets are transforming how people live, learn, and work. Students can now access learning materials on their digital devices and practice outside the classroom. These technological advancements provide more learning opportunities for adult learners, especially adult education and literacy (AEL) students (Jacobs et al., 2014). Students in AEL programs aim to enhance their English reading, writing, listening, speaking, and math skills (Texas Workforce Commission [TWC], 2017). AEL programs also assist students in their transition to postsecondary education and the workforce (Green, 2020). Acquiring technology skills is crucial for developing problem-solving competence and increasing the likelihood of future employment (Cummins et al., 2019). Thus, teaching adult learners to incorporate technology skills

into their daily lives is necessary for AEL programs to meet student needs.

## Technology Integration in Adult Education and Literacy

Although our study occurred before COVID-19, the pandemic exacerbated the need for digital literacy skills and classroom technology integration because social distancing required students and teachers to learn and work online (Belzer et al., 2022). This shift to an increasingly technological world makes this study even more relevant today. Technology integration in AEL classrooms is critical to adult learners' success because technology permeates every facet of modern life. Technology integration refers to the adoption of

technology for educational purposes (Knezek et al., 2000). AEL classrooms in Texas are encouraged to integrate technology into their classrooms and equip students with the skills needed “to find, evaluate, organize, create, and communicate information online” (Office of Career, Technical, and Adult Education [OCTAE], 2015, p. 1). A key driver of this integration is the Workforce Innovation and Opportunity Act of 2014 (WIOA), which outlines digital literacy as a workforce preparation activity. WIOA supports technology usage “for the improvement of teaching, learning, professional development, productivity, and system efficiencies” (OCTAE, 2015, p. 1).

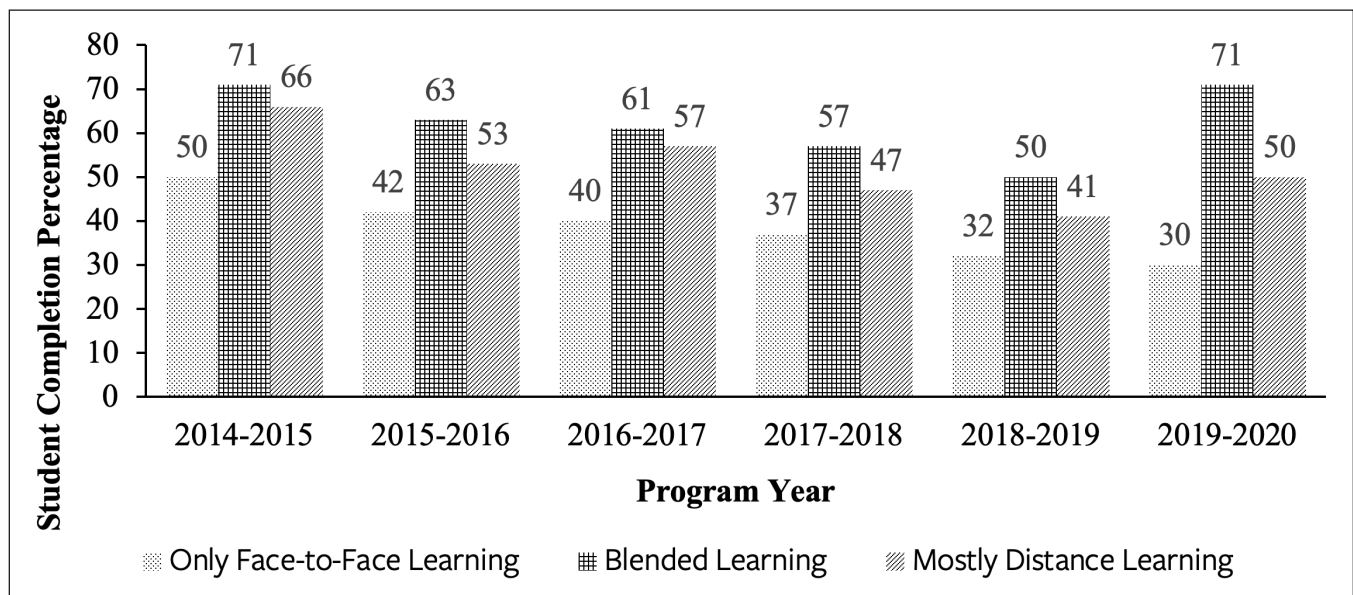
Digital literacies allow adults to fully participate in everyday life, and many AEL students are interested in learning these skills to reach their academic and career goals (Vanek & Harris, 2020). Instructors can facilitate this process by encouraging students to use smartphones and computers to practice their workplace and communication-related skills (McClanahan, 2014). Additionally, teaching digital skills can trigger students’ higher-order thinking (Inverso et al., 2017). Ultimately, research suggests having digital literacy skills can transform adult learners’ lives, leading to greater access to information and global connections (Jacobs et al., 2014). As a result, digital literacy training for adult education practitioners and digital literacy-embedded courses for adult learners are progressing.

### Texas Digital Literacy Initiatives

As part of the 2015-2020 Strategic Plan for Adult Education and Literacy, the Texas Workforce Commission (TWC, 2015) outlined four strategies for promoting a supportive and accountable system: (a) increase workforce, secondary, and postsecondary education, and training outcomes, (b) address demand, (c) increase system coordination and integration, and (d) improve performance excellence. To address strategy one, Texas began integrating digital literacy with the distance learning (DL) initiative for AEL programs in 2015. Through this DL initiative, Texas AEL extended its services to those with limited transportation by integrating DL and technology applications into the curriculum (TWC, 2015). By the 2017-2018 program year (PY), Texas had over 83,000 adult learners enrolled in AEL programs. Many students also participated in DL to supplement their regular classroom instruction. This blended approach enabled face-to-face students to engage in their learning materials at home. According to McKenna et al. (2020), blended learning is an effective instructional delivery method for teaching adult learners because it facilitates self-direction.

Students in Texas AEL programs can enroll in distance education, face-to-face, or blended classes. Students who participate in blended classes are introduced to online learning platforms in the face-to-face classroom. Instructors model how to use these online learning

**FIGURE 1. Percentage of Student Completion from TEAMS Data**



platforms in class, and then students continue working on their learning modules at home. The hours spent working independently are logged as DL hours. When analyzing data from the Texas Educating Adults Management System (TEAMS), we found that students who participated in blended learning had higher completion rates compared to face-to-face (24%) and DL (10%) students (Figure 1). This student completion rate is determined by whether students pass the exit assessment, indicating their readiness to either progress to the next level or exit the program (TWC, 2017). TEAMS data shows that integrating DL with face-to-face instruction can promote students' learning and performance. Thus, preparing AEL instructors to integrate technology and promote DL could greatly benefit students.

The Texas Center for the Advancement of Literacy and Learning (TCALL) provides professional development (PD) to AEL practitioners. This PD center offers training and resources to programs that align with statewide objectives. TCALL also supports programs in integrating distance learning and technology. As researchers from TCALL, we aimed to investigate the status of technology integration in Texas. There is limited research that focuses on technology integration in the context of AEL. Therefore, this study aimed to investigate technology integration in Texas AEL programs. Phase one of this study included a survey of AEL practitioners and their technology skills (Rose et al., 2019), however, more information was needed to understand what factors contribute to technology integration across programs. We chose to interview directors because they are the driving force for change within their programs. To learn more about directors' perspectives on technology integration, we sought to answer the following research questions:

1. What do program directors perceive as contributing factors to technology integration in AEL programs?
2. What do program directors perceive as barriers to technology integration in AEL programs?

## Conceptual Framework

The Will Skill Tool (WST) model of technology integration (Knezek et al., 2000) is the guided conceptual framework for this study. The WST model explains how an educator's

will (attitudes toward using technology in instruction), skills (technology proficiency), and available tools (access to technology) contribute to classroom technology integration and student achievement. These three constructs are assumed to be foundational to technology integration in education. The extended version of this model considers the behavioral components that assess teaching styles, instructional strategies, and instructor confidence in using technology to enhance student learning (Knezek & Christensen, 2016). Evaluating these constructs is critical for understanding the overall status of technology integration in AEL programs. We chose to interview directors because overall program success is dependent on leadership strategies and approaches. Accordingly, we adopted these concepts to understand how program directors perceive their AEL instructors' willingness, skills, tools, and behavior when integrating technology into classrooms.

## Review of the Literature

The following sections discuss the digital divide within AEL programs, the need for PD, and its impact on classroom technology integration.

### The Digital Divide

Although technology integration within AEL classrooms has become a trend, the digital divide has become more evident (Belzer et al., 2022). Kotrlik and Redmann (2005) summarized the barriers AEL educators and students encounter with technology integration, including funding and cost, lack of training and expertise, lack of time and access to technology, resistance to change, technology anxiety, and teacher attitudes towards technology. Recent studies also show that AEL programs and instructors continue to face these barriers (Belzer et al., 2022; Berger, 2010; Hernandez, 2021; McClanahan, 2014). More specifically, internet access within AEL programs remains a significant challenge, especially for low-income communities (Pew Research Center, 2024). In PY 2017-18, 22% (nationwide) and 36% (Texas) of adult education students came from low-income households (OCTAE, 2019a, 2019b). Ultimately, research (Belzer et al., 2022) shows that adult learners and instructors have limited access to computers and other technologies in classrooms and at home.

Although the digital divide continues to be a significant challenge for low-income communities, smartphone usage has increased (Pew Research Center, 2024). Despite this national increase in the number of adults who own a smartphone, their knowledge, and skills in using these devices are limited (Rosen & Vanek, 2017). AEL practitioners suggest that with program and instructor support, learning with mobile devices could enhance education opportunities for students (Carter, 2017). As a result, learning platforms like Cell-Ed, USA Learns, and Quizlet developed mobile-friendly content for students and teachers to utilize in their classrooms and on the go (Vanek et al., 2022). For example, a story shared by Digital Promise (2015) discussed how a bus driver improved her English and digital literacy skills by using a digital learning tool on her smartphone in her spare time. Although smartphones are an excellent tool for helping people build digital literacy skills, instructor willingness is an essential component (Vanek, 2014).

### **Professional Development and Technology**

Instructors who lack expertise in using technology tools need PD to advance their skills (Rosin et al., 2017). In response to this need for additional support and PD, several states, such as Pennsylvania (Kobrin et al., 2021) and Texas (TWC, 2015), established different initiatives to train instructors on using technology resources. The Texas statewide PD center developed a Tech Integration Coach Pathway course for AEL instructors (Wang & Rose, 2020). Participants who complete this seven-level badge course become qualified tech coaches. This initiative helps bring more certified coaches to local programs, allowing them to promote technology integration more effectively.

Despite efforts made by programs across the United States, there is still a lack of technology resources and training for AEL instructors, especially in rural areas (Belzer et al., 2020; Inverso et al., 2017). Furthermore, most instructors in AEL programs work part-time and are left with no time to learn or implement new technology in their classrooms (Rosin et al., 2017). Research suggests that AEL leaders should provide collaborative opportunities and practice-centered training to help instructors more effectively develop the digital skills they need to teach their students (Kobrin et al., 2021). Literature also suggests that instructors adapt their teaching approaches to students' needs and comfort with using technology (Frank & Castek, 2017). Instructors

play an integral role during these periods because they can offer strategies and support to help reduce students' anxiety and increase learner motivation.

### **Classroom Technology Integration**

A study conducted in Minnesota showed that lower-level students in digital literacy programs experienced anxiety about using computers (Digby & Bey, 2014). However, these researchers found that with instructor support, students were more likely to continue their digital literacy learning plans. Similarly, a study conducted in 2020 (Peng) disclosed that adult English language learners often felt anxious in their classes while learning technology or participating in online courses because it induced stress. Thus, teacher support is critical for students to develop digital literacy skills and learner resilience.

Technology integration in adult education classrooms is progressing slowly (Rosin et al., 2017). A study by Hernandez (2021) found that although AEL programs in California provided computer labs for digital literacy, instructors did not integrate computer usage during class. Further, PIAAC 2017 U.S. results on digital problem-solving skills showed that 27% of adults were below level one, the minimum proficiency level required to succeed in simple problem-solving tasks in daily life (National Center for Education Statistics, 2017). Thus, AEL programs must provide more digital support to instructors and students. The current literature outlines the complex dynamics of integrating technology into AEL programs, highlighting both the transformative potential and practical challenges. Thus, further research was needed to understand how program directors promoted technology use and integration within the AEL classroom.

### **Methodology**

A basic interpretive qualitative approach (Merriam & Tisdell, 2015) was used to investigate the technology integration status in AEL classrooms from the perspectives of program directors. There were 34 grant-funded programs at the time this study was conducted. We used purposive sampling (Yin, 2011) to gather a representative sample of urban and rural programs, and 16 programs were selected to participate. An email invitation was sent, and fifteen directors agreed to participate. The sample consisted of six urban and nine rural program directors. Interviews were scheduled from

mid-August to mid-September of 2018. The participants and their program information are presented in Table 1. Two participants were male and thirteen were female. These

directors had a variety of educational backgrounds and experience in adult education. Each program varied in size and capacity.

**TABLE 1. Participant and Program Information**

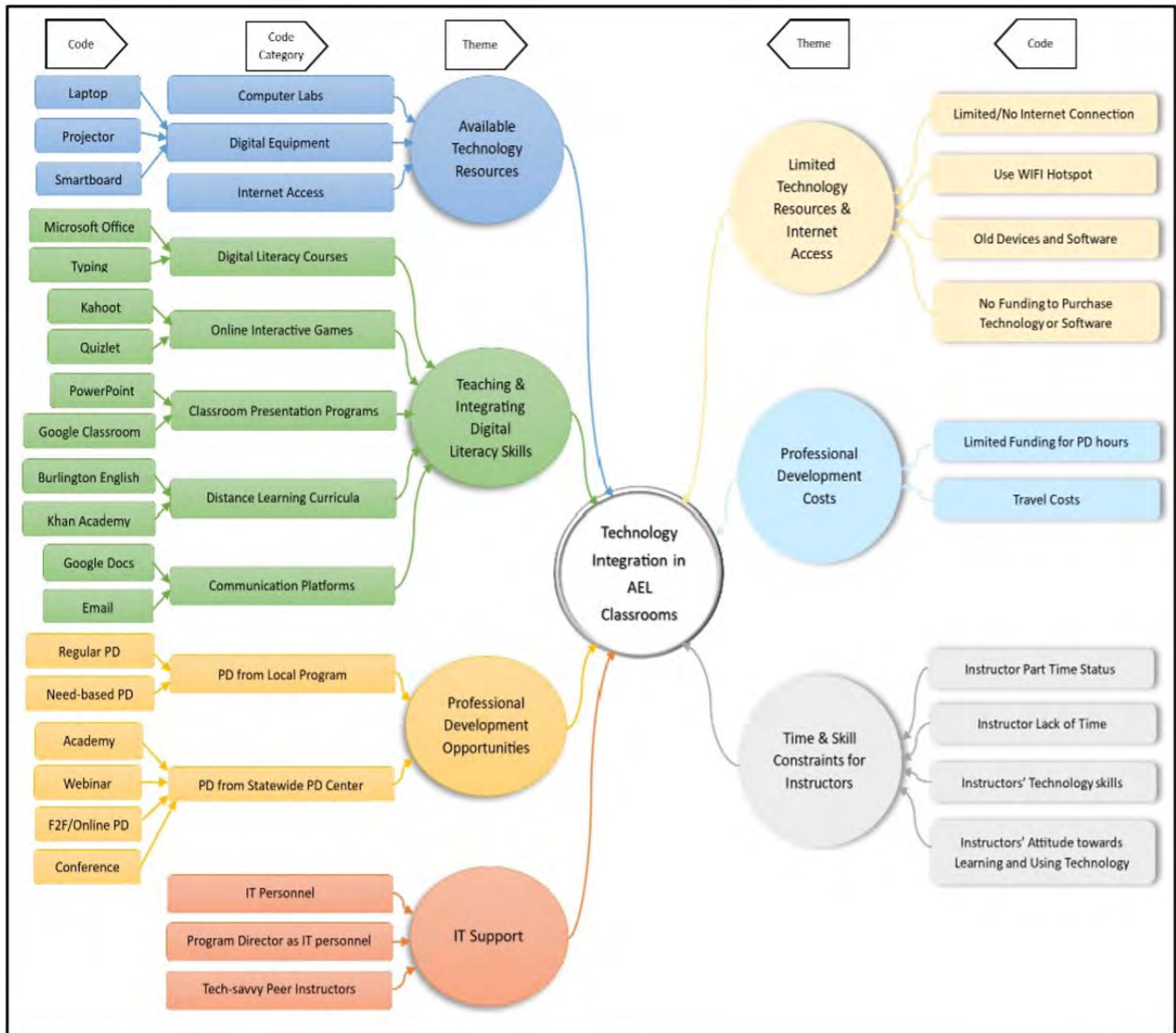
Participant code	Gender	Highest degree	Years working in AEL	Program		
				Area	Number of instructors (Rounded)	Estimated number of students enrolled per semester
RPD1	F	Master	9	Rural	35	1,100
RPD2	F	Bachelor	22	Rural	55	3,500
RPD3	M	Master	17	Rural	110	2,000
RPD4	F	Master	6	Rural	25	800-900
RPD5	F	Bachelor	15	Rural	25	225
RPD6	M	Master	8	Rural	50	1,000-1,200
RPD7	F	Master	13	Rural	45	600
RPD8	F	Master	4	Rural	25	800-900
RPD9	F	Master	22	Rural	35	800-1,200
UPD1	F	Master	24	Urban	190	4,200-4,400
UPD2	F	Doctorate	11	Urban	55	2,100
UPD3	F	Master	7	Urban	250	Over 9,000
UPD4	F	Doctorate	13	Urban	605	6,800
UPD5	F	Bachelor	24	Urban	95	2,500
UPD6	F	High School Diploma	40	Urban	30	1,300-1,500

Note: RPD=Rural Program Director, UPD=Urban Program Director, F=Female, M=Male

All 15 phone interviews were hosted, and audio recorded through WebEx. Most interviews lasted an hour or more, but two lasted 45 minutes. Interviews were semi-structured (Merriam & Tisdell, 2015) with open-ended questions that asked about available resources for instructors, technology implementation, and additional training needs. Researchers took notes during the interviews and transcribed the audio recordings verbatim. The data was analyzed using a thematic approach (Merriam & Tisdell, 2015). Data analysis involved preliminary manual coding followed by electronic coding using ATLAS.ti 8.0 (qualitative data analysis software). The researchers unitized the data and coded it independently. After two independent coding rounds, the researchers compared and consolidated coding categories

into themes for consistency (Patton, 2002). This iterative process involved regular discussion, and themes were established through careful analysis and interpretation of interview transcripts. Figure 2 is a visual representation of how this process occurred. A peer examination (Merriam & Tisdell, 2015) was also conducted as an added validation measure. The lead investigator (Dr. Rose) has been an adult education practitioner for over thirty years. Throughout this time, she came to learn and understand the intricacies of Texas AEL programs. This prolonged engagement (Lincoln & Guba, 1985) with study participants enabled the lead researcher to develop relationships and rapport, further validating the themes that emerged in this study.

**FIGURE 2. Visual Representation of Codes and Themes**



## Findings

From the interviews with AEL program directors, we identified four contributing factors and three barriers to technology integration. The four contributing factors were: available technology resources, teaching and integrating digital literacy skills, professional development opportunities, and IT support. The three barriers were: limited technology resources and internet access, professional development costs, and instructors’ time and skill constraints. The following sections present the seven themes.

### Contributing Factors to Technology Integration

The outcomes revealed four factors that supported technology integration. First, technology resource availability influenced the application of technology usage. Second, programs that had the resources integrated digital literacy into their curriculum. Third, participation in PD helped strengthen instructors’ technical skills. Lastly, IT support encouraged practical integration.

### **Available Technology Resources**

AEL programs host several teaching sites across urban and rural communities. These communities have varying needs regarding technology access and availability. Thus, programs had different approaches to providing technology resources across sites. For example, all 15 AEL programs established at least one computer lab location to comply with the states' technology integration initiative. However, student access to these labs varied across programs.

Most programs partnered with community colleges, Independent School Districts (ISD), libraries, or churches to expand access to computers and the Internet. One program director (UPD2) said, "If [sites] have access to the internet, then they have computers. In the main building, we have computer labs and a handful of computers in every classroom." UPD4 added, "The on-campus classes are the easiest ones for the integration of technology because each of the classrooms [at the community college] has a teacher presentation panel where there is a computer, speakers, and projectors." RPD6 also commented, "We have pretty good internet connectivity because we're either in the workforce building or a school district. A lot of ISDs will let us have classes there, and it's in the agreement that they'll give us internet access."

RPD3 had a different experience and mentioned that "a lot of our ISDs are afraid to let us use their computers." This statement indicates that programs might need to better coordinate contract agreements when establishing partnerships. Technology availability, such as computers, laptops, iPads, projectors, and smartboards, varied based on class locations. According to program directors' descriptions, instructors used what was available to teach, but there was still insufficient technological equipment for all instructors.

### **Teaching and Integrating Digital Literacy Skills**

Programs tailored digital literacy instruction to meet the needs of their students and the local job market. Some students did not have access to the internet at home and were reluctant to use technology. Many directors encouraged their instructors to improve their student's digital literacy skills by integrating technology into their lessons. UPD5 stated:

We have computers available, but the teachers say the ESL students are too low-skilled. They don't know how to use computers. This is why I always think we should be showing them how and getting them introduced as soon as possible.

As a result, AEL programs developed beginning computer literacy courses to teach typing skills and Microsoft Office programs (RPD5, UPD1&6). Other program directors shared how instructors contextualized their lessons by teaching students to create resumes, search for jobs (RPD5), research their home countries, and write reports (RPD6). UPD6 specified that "students need to work in Excel, so our program tries to integrate that into our math course to teach them to create charts." Programs were creating digital literacy courses that aligned with students' needs and interests.

Instructors who taught more advanced courses integrated technology by using online interactive games like Kahoot or Quizlet to test students on learning outcomes. They also used platforms like email, text, and Google Docs to communicate with students. Further, many instructors used classroom presentation programs like PowerPoint and Google Classroom to facilitate lessons. Some programs even incorporated distance learning curricula like Burlington English, Aztec, and Khan Academy, which supported student learning at home. Instructors were integrating digital literacy with different approaches to enhance student skills and learning. Students thoroughly enjoyed these new learning opportunities. For example, RPD9 described, "We designed an advanced digital literacy class similar to a college-level computer class but just at a slower pace. Those classes are filling up fast with young adults 17-18 years old who cannot operate a computer." These findings show that AEL programs are designing digital literacy courses that align with student's needs.

### **Professional Development Opportunities**

All Texas AEL instructors are required to complete 15 PD hours each program year. Instructors must attend at least 9 hours of training from the statewide PD center. The remaining 6 hours can be earned at local programs. PD opportunities are provided in person, online, via live webinars, and at literacy conferences. PD session categories include principles of adult learning, literacy development, and other more general topics. Practitioners must earn certifications in each category to meet the annual requirement and teach. Local programs also host

regular and need-based training for their instructors. For example, RPD6 said, “We try to train the teachers as much as we can in using the equipment...we had a training session on Kahoot. Now they take that back to teach.” Instructors also utilized the training courses offered by the statewide PD center.

The statewide PD center hosts an online learning management system (the PD Portal) for practitioners to participate in online learning opportunities. Live webinars, online learning modules, and discussion forums are available in the PD Portal to encourage users to collaborate and complete their PD hour requirements at their own pace. UPD4’s instructors completed the Distance Learning Academy course to prepare for teaching adult students at a distance. Similarly, several instructors at UPD3’s program took the Google Academy course. Both directors discussed that by having qualified instructors, they could bring DL or Google into their classrooms. One program director (UPD3) expressed how the PD Portal makes finding training and resources easier by saying,

I’m more involved with what’s going on with PD, I think it’s a little bit easier for us to find it through the PD portal. I think that Laura [Learning Management Specialist] has been amazing in helping us on both ends of the PD portal for us to have a better understanding and the emails are awesome. With the Tech and Tells, with the professional development opportunities that are available. Those notices are amazing. So I think now we’re more involved, and we have the ability to find out what’s there. And we know who we can contact too so I think those resources are there.

The statewide PD center offers various monthly webinars, including the Tech and Tell series. The Tech and Tell series focuses on demonstrating technology tools or websites that can help instructors stay organized, engage students, and enhance their tech skills. Seven program directors mentioned that some of their instructors had become regular Tech and Tell attendees. RPD9 shared, “We brought in Google Sites last year and discussed what was on the Tech and Tells.” However, three program directors also discussed that they did not know how many instructors utilized these webinars. Two program directors further addressed the need for follow-up training sessions and support after instructors participated in a technology-related PD session. RPD8 articulated, “It’s great that we do training and show them the technology that can be implemented. But then, are we showing them how to implement and coaching them through

that implementation process?” This statement implies that programs need onsite technical support personnel to facilitate ongoing implementation. In all, positive feedback about resources like Tech and Tell webinars could encourage instructors to attend PD more often and increase technology use in the classroom.

### **IT Support**

Although PD opportunities are readily available for instructors and staff, having regular information technology (IT) support is essential for successful technology integration. Seven (3 urban and 4 rural) programs had one or more technology-skilled instructors or staff members to help with technical assistance. UPD2 said, “In my program, everybody nurtures and takes care of each other. I’m very fortunate to have two teachers with master’s degrees in technology. Between the two of them, they help everybody.” Similarly, RPD6 shared how their instructors learned to use the new smartboards:

They are just kind of teaching themselves. We have one lady who worked pretty extensively on it. She used to be a workforce person, and they used them there, so she’s leading and teaching the others how to use the smartboard.

Some program directors acted as the tech-support person for their program too. As RPD5 noted, “I only have 7 teachers. They just holler at me and ask: how do you do this? And I show them how to do it.” Smaller programs tend to use their own instructors and staff as IT support.

Hiring an IT staff was another approach that programs used to supplement technical assistance. RPD4 said:

I have an amazing IT guy. I always joke that he is the glue of the program because he will do training anytime that we implement anything new, like distance learning software. ...if it’s just one teacher who has a question on how something works, my IT guy will go out there and show them what to do.

UPD6 shared that they hired a formal director of technology to help other staff with technology:

One of the things that she does is she works with one of our classes as a trainer for an online distance learning IET [integrated education training] program... she’s actually giving hands-on training... she’s available to help our staff in any way as far as any types of technology that we need. ...35 staff total that I feel everybody has really good skills.

Programs who had technology-skilled staff to assist with technology integration seemed to progress better.



Other programs received IT support from local communities they partnered with. UPD3 shared how IT supports their instructors: “We started partnering with the local ISD’s technology service department. They come into the classroom to help the students learn, but at the same time, you have the instructors in the class, so there’s dual learning going on.” UPD5 said, “We have an excellent tech coach, and she does a great job of trying to stay proactive.” When programs had IT or peer instructor support, instructors were more willing to integrate technology into their content delivery. Therefore, having a technology-skilled person available is needed for programs to promote technology integration successfully.

### Barriers to Technology Integration

Three barriers were found to inhibit technology integration. First, insufficient technology resources and unstable internet access made it difficult to use technology. Second, sending instructors to take in-person PD is costly. Lastly, instructors lacked time and skills due to AEL policies and their working status.

#### **Limited Technology Resources and Internet Access**

The lack of technology-related resources is a constant challenge for Texas AEL programs. Providing and upgrading technological equipment and software for the classroom is costly. UPD2 said, “Our challenge is funding...not having enough computers for every student, and not having internet access at all the locations.” Several programs were using outdated and low-quality equipment. RPD4 shared, “Our program is using 10-year-old computers predominantly in rural areas, and we don’t have enough funds to replace them.” UPD1 noted, “Some of the south locations don’t have computer labs... we do have some laptops... but they’re bulky, hard to carry around, and have security issues.” Furthermore, RPD4 emphasized, “Our GED [General Educational Development] students take turns using computers because they only have eight available at that one site. We only open a new site when that location has internet and computer access.” Technology is constantly changing and updating, making it difficult for programs to keep up with.

Rural communities faced additional challenges when trying to integrate technology. For example, limited internet access and classroom spaces made it difficult for programs to host classes. RPD9 pointed out that “internet

service in some of the areas...is very spotty and slow... we used to use Prezi in our orientation sessions, and we had to go back to a PowerPoint because the Prezi system wasn’t running.” Moreover, RPD1 and UPD6 mentioned that they must use hotspots for the Internet at some rural sites’ classes. It was also challenging for students to access computers and the Internet outside classrooms. RPD7 explained:

It takes about 2 hours to fill up one of the semi-tractor trailer trucks with either sand or water. And this was the time that truck drivers were allotted to do their GED or computer classes or college classes, but there was no connectivity.

Texas covers 268,597 square miles, making it challenging to offer convenient classroom locations to adult learners in rural areas. Students might also lack childcare, transportation services, or financial support, hindering them from attending class. RPD1 explained:

Some of those communities are so small it’s maintaining a class size of even 5 where you have continual attendance. It becomes a cost-effective issue, and you can’t just open a class. I’ve got one student 20 miles away from this county. They won’t drive 20 miles 2 nights a week to go to class. They don’t have the resources, the gas money, or childcare, and they’re not going to do it consistently.

Programs faced these hardships when recruiting and retaining students. Resources for students and internet availability impacted computer access, classroom locations, and the number of courses offered. Thus, programs needed more funds to host distance learning opportunities and give students and instructors computers and hotspots.

#### **Professional Development Costs**

For programs, supporting instructors to take PD in person is costly. RPD1 noted, “If it’s local training, I have to bring everybody in...by the time you pay mileage, pay them for their day, I’m looking at \$9,000-\$10,000, and I don’t have the money to do that many times.” Moreover, only one program director, RPD2, mentioned that they have instructors attending a state conference for educational technology. It is difficult for programs to budget PD funds above the 15-hour requirement. RPD 4 asserted, “I will pay them for 15 hours. Other than that, they can ask, and sometimes I say yes, sometimes I say no, depending on where we’re at budget-wise.” Similarly, RPD6 addressed:

Our biggest problem in PD...is time. Because the budgets are tight and you are going to pay teachers...The biggest part of our expenditures is payroll, so increasing hours to an already busy day for them to teach becomes difficult to fund the hours for them to get PD.

In addition, RPD8 explained that because the PD plan for the year was already in place, they could not add in more. Even if they really needed technology integration training for instructors who are not technology literate, they had to wait until next year. Due to insufficient funds, programs must strategically plan and budget PD training events.

### ***Instructors' Time and Skill Constraints***

Instructor time constraints were another major concern. The majority of AEL instructors are part-time (over 90%) and are current or retired teachers from the K-12 system. The state law for part-time workers is strictly regulated to where instructors only have 19 paid working hours per week. These time restrictions make it difficult for instructors to invest in technology integration. Instructors preferred being in the classroom rather than attending PD for technology integration. UPD4 explained:

The majority of our staff can only work 19 hours per week. When training is 6 or more hours, it creates a hardship because that instructor would have to back out of some instructional time to complete the DL or technology training.

RPD3 addressed their situation:

People are busy and they're part-time teachers. So, they invest little time in technology if they don't have a knack for it already... I'd say about 25% of our staff are interested and gung-ho about technology and are looking for training.

Many program directors wished they could allow more time for instructors to take PD.

Most program directors indicated that some instructors were uncomfortable or had low interest in implementing technology because they lacked time and skills. RPD8 pointed out why his retired instructor struggled, "It's retired teachers with limited technology experience. I'm thinking of one teacher specifically, and it may have been the reason she retired. The technology was coming out and it was uncomfortable for her." RPD2 also noted how they convinced their instructors, "We need to get the teachers to buy in to use it...We also need to teach them technology problem-solving skills." Urban program directors mentioned some of their instructors are

technology challenged as well. UPD5 illustrated, "some are using it effortlessly and others need more help because they're unaware of what's there and unsure how to." UPD2 noted, "Some teachers just don't use it...very old school... like handouts." Retired teachers and unskilled instructors tend to have more resistance to learning new technology due to time constraints and low motivation.

## **Discussion**

This study revealed several challenges and strategies for technology integration prior to the COVID-19 pandemic. Challenges such as the need for virtual learning opportunities were resolved amidst the pandemic, and others still need to be addressed. Although this study was conducted in 2018, the identified challenges persist in adult education. The identified strategies can also inform the field today. Recommendations to overcome the barriers to technology integration are discussed in the following sections.

Many directors emphasized that they needed adequate access to computers and the Internet to successfully integrate technology. Our findings showed that programs with computer labs and Internet access were more likely to use tools like Kahoot, PowerPoint, and Google. These programs also built digital literacy curricula into their course offerings. Technology funding became more readily available after the onset of COVID-19, and this made it easier for programs to purchase equipment for students and instructors (Belzer et al., 2022). Texas AEL digital device loan services for students are now available and have proven to help students continue learning (Wang et al., 2022). Although programs have returned to in-person classrooms, many are still providing virtual learning opportunities. This digital expansion allows students to attend school despite any transportation or childcare barriers they may face.

Along with increased access to technology resources, regular and up-to-date PD opportunities allowed instructors to quickly integrate technology into their classrooms. Many program directors expressed that PD opportunities for technology helped teachers with integration. However, some directors also reported that many instructors were hesitant to learn new technology skills. COVID-19 was a motivating force for change, as it

required practitioners to brush up on their technology skills at a moment's notice. The PD Portal was a critical resource throughout this time, allowing practitioners to take the courses they needed for virtual instruction (Wang et al., 2022). Although programs have returned to in-person activities, classroom technology use remains.

The statewide PD center paved the way for many programs as they transitioned to virtual learning in 2020. Online PD courses offered by the center are a flexible and cost-effective option for AEL programs. AEL programs in California also had success with virtual PD offerings after COVID-19 (Zachry & Rayala, 2022). With the expansion of online PD courses, AEL instructors can take training on their own time, reducing training costs. Online participants have also shared positive feedback about their experiences, indicating that they found useful practices and content from these online courses (Wang et al., 2022). Therefore, we recommend program directors in Texas encourage instructors to participate in online PD courses. We also suggest PD coordinators plan supplemental sessions with technology assistants to reinforce skills learned. Other states should consider offering online PD courses and supplemental support for instructors as needed to enhance technology integration in AEL classrooms.

Professional learning is most impactful when accompanied by peer support (Stewart, 2014). For example, our findings indicated that instructors were more willing to use and learn about technology when programs offered IT services or had tech-savvy colleagues to support them with technical issues. Moreover, technology coaches can support instructors to effectively implement tools (Darling-Hammond et al., 2017). Thus, we urge Texas AEL programs to continue providing technical support to instructors and staff and encourage them to participate in the Tech Integration Coach Pathway course.

As indicated above, adequate access to technology resources is essential for integration and adaptation. However, these resources can be costly, especially for students and part-time instructors. The Texas State Report showed that one-third of adult education students enrolled in programs during the 2017-18 program year came from low-income households (OCTAE, 2019a). Limited internet access also remains an issue for rural areas. AEL programs may consider

purchasing low-cost refurbished computers or laptops (Rosen, 2022) to increase student access to technology resources. Braided funding agreements are another potential solution for AEL programs to increase financial resources (TWC, 2017; Vanek & Harris, 2020). Several programs we interviewed successfully created partnerships and braided funding with local independent school districts to gain computer access. Therefore, it could be advantageous for AEL programs to develop partnerships with local businesses to establish resources for instructors and students.

While having access to technology in the classroom is crucial for developing digital literacy, it is the instructor's willingness to learn and skills to incorporate technology into their teaching that ultimately determines the success of technology integration. Our findings pointed out that instructors with low technology skills or low interest had higher resistance to technology integration. Phase one of this study included a technology proficiency self-assessment (Rose et al., 2019), which indicated that rural program instructors had lower levels of confidence in using slideshows and software applications in the classroom. Similarly, Yenai (2021) found that the deficiency of adult education instructors' technology competency is a main barrier to technology integration. As a result, AEL programs should aim to enhance instructors' self-efficacy and develop their technology skills so that they can effectively adopt technology in the classroom and transfer their knowledge to students.

### Limitations and Future Directions

Although the data from this study did not directly reflect the voices of AEL instructors, it revealed what program directors perceive about their staff's willingness, skills, available tools, and behaviors when integrating technology. This study is significant because it highlights how access to technology resources and professional development enables programs to break barriers and successfully integrate technology into classrooms. This study also adapts concepts from the WST model to the field of adult education, which to our knowledge, has not been done before. However, instructor perspectives and student skills should also be considered to holistically assess the progress of technology integration. Future research is required to include instructors' and students' perspectives on technology integration in the classroom to evaluate

whether it supports their needs. Another limitation of this study is that it focused on grant-funded AEL programs. Faith-based and volunteer initiative programs might encounter different challenges when implementing technology in AEL classrooms. Ultimately, the COVID-19 pandemic has changed the field of adult education and its need for technology integration. Many AEL instructors must now teach online; therefore, future research may investigate what strategies can be implemented to swiftly adapt to online instruction.

## Conclusion

Digital literacy and technology skills in adult education have never been more critical. As reflected above, access to technology resources is essential for classroom integration. Lack of technology resources and technology

training make it difficult for students and instructors to learn new skills. Digital inequity and ability exacerbate the difficulties of AEL students, and these inequities became even more apparent during COVID-19. Stay-at-home orders put adult educators, learners, and their children at greater risk of financial and educational losses as most did not have the resources to work or study from home. Although stay-at-home orders have lifted, technology use and integration continue to expand throughout classrooms and workspaces. To align with the Texas AEL Strategic Plan (2015-2020 and 2021-2026) and help students find employment that provides a family-sustaining wage, a concerted effort must be made toward making computer and internet access available to all. AEL providers must prepare their instructors and train adult learners to use technology in ways that support themselves, their families, and their communities.

## References

- Belzer, A., Leon, T., Patterson, M., Rhodes, C., Salas-Isnardi, F., Vanek, J., Webb, C., & Wilson-Toro, B. (2020). *COVID-19 rapid response report from the field*. ProLiteracy. <https://www.literacynewyork.org/documents/Covid-19/COVID-19-Report.pdf>
- Belzer, A., Leon, T., Patterson, M., Salas-Isnardi, F., Vanek, J., & Webb, C. (2022). From rapid emergency response to scaling and sustaining innovation: Adult foundational education in the time of COVID-19. *New Directions for Adult and Continuing Education*, 2022, 81-91. <https://doi.org/10.1002/ace.20454>
- Berger, J. I. (2010). Profiles of internet use among ALBE instructors. *Adult Basic Education and Literacy Journal*, 4(3), 151-160.
- Carter, J. (2017). Expanding access to learning with mobile digital devices. *Journal of Research & Practice for Adult Literacy, Secondary & Basic Education*, 6(2), 49-54.
- Cummins, P. A., Yamashita, T., Millar, R. J., & Sahoo, S. (2019). Problem-solving skills of the workforce and preparedness for job automation. *Adult Learning*, 30(3), 111-120. <https://doi.org/10.1177/1045159518818407>
- Darling-Hammond, L., Hylar, M. E., & Gardner, M. (2017). *Effective teacher professional development*. Learning Policy Institute.
- Digby, C., & Bey, A. (2014). Technology literacy assessments and adult literacy programs: pathways to technology competence for adult educators and learners. *Journal of Literacy and Technology*, 15(3), 28-57.
- Digital Promise. (2015, February 18). *A developer and a CBO make a difference in adult education*. <https://digitalpromise.org/2015/02/18/the-anatomy-of-a-solution-how-a-developer-and-a-cbo-are-making-a-difference/>
- Frank, T., & Castek, J. (2017). From digital literacies to digital problem solving: Expanding technology-rich learning opportunities for adults. *Journal of Research and Practice for Adult Literacy, Secondary, and Basic Education*, 6(2), 66-70.
- Green, A. M. (2020). Texas hold'em: Engaging employers to close the skills gap. *COABE Journal: The Resource for Adult Education*, 9(1), 48-67.
- Hernandez, R. (2021). Program development of digital literacy workshops to help adult students navigate "everyday" life. *COABE Journal: The Resource for Adult Education*, 10(2), 46-53.
- Hobbs, R. & Coiro, J. (2019). Design features of a professional development program in digital literacy. *Journal of Adolescent & Adult Literacy*, 62(4), 401-409. <https://doi.org/10.1002/jaal.907>
- Inverso, D. C., Kobrin, J., & Hashmi, S. (2017). Leveraging technology in adult education. *Journal of Research and Practice for Adult Literacy, Secondary, and Basic Education*, 6(2), 55-58.
- Jacobs, G. E., Castek, J., Pizzolato, A., Reder, S., & Pendell, K. (2014). Production and consumption: A closer look at adult digital literacy acquisition. *Journal of Adolescent & Adult Literacy*, 57(8), 624-627. <https://doi.org/10.1002/jaal.293>
- Knezek, G., & Christensen, R. (2016). Extending the will, skill, tool model of technology integration: adding pedagogy as a new model construct. *Journal of Computing in Higher Education*, 28(3), 307-325. <https://doi.org/10.1007/s12528-016-9120-2>
- Knezek, G., Christensen, R., Hancock, R., & Shoho, A. (2000, February). *Toward a structural model of technology integration* [Paper presentation]. Hawaii Educational Research Association Conference, Honolulu, HI, United States.
- Kobrin, J., Bullock, P. N., Gierke, J., & Heil, C. (2021). Adult educators adopting technology in their classrooms through innovation, collaboration, and inquiry. *Adult Literacy Education: The International Journal of Literacy, Language, and Numeracy*, 3(1), 49-54. <http://doi.org/10.35847/JKobrin.PBullock.JGierke.CHeil.3.1.49>
- Kotrlik, J. W., & Redmann, D. H. (2005). Extent of technology integration in instruction by adult basic education teachers. *Adult Education Quarterly*, 55(3), 200-219.
- Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. Sage.
- McClanahan, L. (2014). Training using technology in the adult ESL classroom. *Journal of Adult Education*, 43(1), 22-27.
- McKenna, K., Gupta, K., Kaiser, L., Lopes, T., & Zarestky, J. (2020). Blended learning: Balancing the best of both worlds for adult learners. *Adult Learning*, 31(4), 139-149. <https://doi.org/10.1177/1045159519891997>
- Merriam, S. B., & Tisdell, E. J. (2015). *Qualitative research: A guide to design and implementation*. John Wiley & Sons, Inc.
- National Center for Education Statistics. (2017). Highlights of PIAAC 2017 U.S. results. [https://nces.ed.gov/surveys/piaac/national\\_results.asp](https://nces.ed.gov/surveys/piaac/national_results.asp)
- Patton, M. Q. (2002). *Qualitative research and evaluation methods*. Sage.
- Peng, M. (2020). Motivate beginning level adult ESL learners in online teaching. *Master's Projects and Capstones*, 1129. <https://repository.usfca.edu/capstone/1129>
- Pew Research Center. (2024). Americans' use of mobile technology and home broadband. <https://www.pewresearch.org/internet/2024/01/31/americans-use-of-mobile-technology-and-home-broadband/>

- Rose, G. L., Wang, C., Sainz, A., & Joshi, S. (2019, June). Technology use and integration in adult education and literacy classrooms. *Proceedings of the Adult Education Research Conference*, Buffalo, NY, USA. <https://newprairiepress.org/aerc/2019/papers/2>
- Rosen, D. J. (2022). Refurbished computers for adult learners at home or in class. *Adult Literacy Education: The International Journal of Literacy, Language, and Numeracy*, 4(1), 74-78. <http://doi.org/10.35847/DRosen.4.1.74>
- Rosen, D. J., & Vanek, J. B. (2017). Technology for innovation and change in adult basic skills education. *New Directions for Adult and Continuing Education*, 2017(155), 51-60. <https://doi.org/10.1002/ace.20240>
- Rosin, M., Vanek, J., & Webber, A. A. (2017). How investment in technology can accelerate collective impact in adult learning. World Education. <https://worlded.org/resource/how-investment-in-technology-can-accelerate-collective-impact-in-adult-learning/>
- Stewart, C. (2014). Transforming professional development to professional learning. *Journal of Adult Education*, 43(1), 28-33.
- Texas Workforce Commission. (2015). *Adult education and literacy strategic plan for FY 2015-2020*. <https://twc.texas.gov/files/twc/twc-strategic-plan-adult-education-literacy-fy2015-2020.pdf>
- Texas Workforce Commission. (2017). *Texas adult education and literacy guide*. <https://tcall.tamu.edu/docs/17-Texas-AEL-Guide-TWC.pdf>
- Office of Career, Technical and Adult Education. (2019a). *Statewide performance report—WIOA Title II adult education program PY2017-18*. <https://www2.ed.gov/about/offices/list/ovae/pi/AdultEd/spr/py2017/texas.pdf>
- Office of Career, Technical and Adult Education. (2019b). *National summary of the statewide performance report—WIOA Title II adult education program PY2017-18*. <https://www2.ed.gov/about/offices/list/ovae/pi/AdultEd/spr/py2017/nationalsummary.pdf>
- Office of Career, Technical, and Adult Education. (2015). *Integrating technology in WIOA, March 2015 fact sheet*. <http://www2.ed.gov/about/offices/list/ovae/pi/AdultEd/integrating-technology.pdf>
- Vanek, J. & Harris, K. (2020). Digital literacy and technology integration in adult basic skills education: A review of the research. *ProLiteracy*. <https://www.proliteracy.org/briefs#TechnologyIntegration>
- Vanek, J., Simpson, D., Harris, J., & Goumas, J. (2022). *IDEAL distance education and blended learning handbook*. World Education.
- Wang, C. & Rose, G. L. (2020). Teaching Case—Gamified tech integration coach pathway for AEL teachers and staff. *New Horizons in Adult Education and Human Resource Development*, 32(4), 82-88. <https://doi.org/10.1002/nha3.20300>
- Wang, C., Sainz, A., Joshi, S. C., & Alfred, M. V. (2022). A case study of adult education and literacy programs and the transition to remote services during the COVID-19 pandemic. *New Horizons in Adult Education and Human Resource Development*, 34(1), 37-50. <https://doi.org/10.1002/nha3.20352>
- Workforce Innovation and Opportunity Act, 29 USC 301 § 2, (2014).
- Yenal, E. (2021). *Technology integration barriers encountered by adult learning program teachers*. [Doctoral dissertation, Northcentral University]. ProQuest Dissertations Publishing.
- Yin, R. K. (2011). *Qualitative research from start to finish*. Guilford Publications.
- Zachry, C. & Rayala, C. (2022). California's adult education pandemic pivot. *COABE Journal: The Resource for Adult Education*, 11(2), 154-165.